

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

Claims 1-22 (Cancelled).

Claim 23 (Previously Presented): A key-frame extraction system, comprising:
video frame extractor that extracts each of a series of video frames from a video;
a set of frame analyzers that obtain the series of video frames in parallel from the video frame extractor, each frame analyzer selecting a corresponding set of candidate key-frames from the series by performing a different corresponding analysis on each video frame in the series such that the analyses are selected to detect multiple types of meaningful content in the video;
key-frame selector that obtains the corresponding candidate key-frames from each frame analyzer and arranges the candidate key-frames into a set of clusters and that selects one of the candidate key-frames from each cluster as a key-frame for the video.

Claim 24 (Previously Presented): The key-frame extraction system of claim 23, further comprising an audio event detector that obtains the series of video frames from the video frame extractor and that selects a corresponding set of candidate key-frames from the series by performing an audio analysis on each video frame in the series and that provides the corresponding set of candidate key-frames to the key-frame selector.

Claim 25 (Previously Presented): The key-frame extraction system of claim 23, wherein the key-frame selector selects the key-frames by determining an importance score for each candidate key-frame in each cluster.

Claim 26 (Previously Presented): The key-frame extraction system of claim 25, wherein the key-frame selector determines the importance scores by determining an image content of each candidate key-frame.

Claim 27 (Previously Presented): The key-frame extraction system of claim 25, wherein the key-frame selector determines the importance scores by determining an audio content of each candidate key-frame.

Claim 28 (Previously Presented): The key-frame extraction system of claim 23, wherein the key-frame selector selects the key-frames by determining an image quality for each candidate key-frame in each cluster.

Claim 29 (Previously Presented): The key-frame extraction system of claim 23, wherein the frame analyzers include a color histogram analyzer.

Claim 30 (Previously Presented): The key-frame extraction system of claim 23, wherein the frame analyzers include a color layout analyzer.

Claim 31 (Previously Presented): The key-frame extraction system of claim 23, wherein the frame analyzers include a fast camera motion detector.

Claim 32 (Previously Presented): The key-frame extraction system of claim 23, wherein the frame analyzers include a camera motion tracker.

Claim 33 (Previously Presented): The key-frame extraction system of claim 23, wherein the frame analyzers include an object motion analyzer.

Claim 34 (Previously Presented): The key-frame extraction system of claim 23, wherein the frame analyzers include a human face detector.

Claim 35 (Previously Presented): The key-frame extraction system of claim 23, further comprising a user interface for displaying a set of video frames in the video previous to each key-frame and a set of video frames in the video subsequent to each key-frame and for obtaining a user selection of one or more of the video frames.

Claim 36 (Currently Amended): A method for key-frame extraction, comprising:

selecting multiple sets of candidate key-frames from a video including detecting multiple types of meaningful content in the video by performing in parallel a set of different analyses on each video frame in the video;

arranging the candidate key-frames into a set of clusters; and

selecting one of the candidate key-frames from each cluster as a key-frame for the video,

wherein arranging the candidate key-frames and selecting one of the candidate key-frames are performed by a key-frame extraction system, and wherein the key-frame extraction system outputs the selected one key-frame from each cluster as the key-frames for the video.

Claim 37 (Previously Presented): The method of claim 36, wherein selecting multiple sets of candidate key-frames includes selecting a set of candidate key-frames from the video by performing an audio analysis on each video frame in the video.

Claim 38 (Previously Presented): The method of claim 36, wherein selecting one of the candidate key-frames from each cluster includes determining an importance score for each candidate key-frame in each cluster.

Claim 39 (Previously Presented): The method of claim 38, wherein determining an importance score comprises determining an image content of each candidate key-frame.

Claim 40 (Previously Presented): The method of claim 38, wherein determining an importance score comprises determining an audio content of each candidate key-frame.

Claim 41 (Previously Presented): The method of claim 36, wherein selecting one of the candidate key-frames from each cluster includes determining an image quality for each candidate key-frame in each cluster.

Claim 42 (Previously Presented): The method of claim 36, wherein performing in parallel a set of different analyses includes performing a color histogram analysis.

Claim 43 (Previously Presented): The method of claim 36, wherein performing in parallel a set of different analyses includes performing a color layout analysis.

Claim 44 (Previously Presented): The method of claim 36, wherein performing in parallel a set of different analyses includes performing a fast camera motion analysis.

Claim 45 (Previously Presented): The method of claim 36, wherein performing in parallel a set of different analyses includes performing a camera motion detection.

Claim 46 (Previously Presented): The method of claim 36, wherein performing in parallel a set of different analyses includes performing an object motion track.

Claim 47 (Previously Presented): The method of claim 36, wherein performing in parallel a set of different analyses includes performing a human face detection.

Claim 48 (Previously Presented): The method of claim 36, further comprising displaying a set of video frames in the video previous to each key-frame and a set of video frames in the video subsequent to each key-frame and obtaining a user selection of one or more of the video frames.